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These informal remarks are based primarily on the nearly ten years that Ted Galambos spent at Lehigh. The narrative starts with some excerpts from our early correspondence, beginning with a letter dated June 24, 1956:

> Dear Sir: In September, 1955, you gave a one-week course in the theory of limit design. Since I was in the service, I was unable to attend. I would like to know if you are offering the same course or a similar course this summer. If you are offering post-graduate study, I would be very much interested in details concerning your program, the cost, and the possibility of part-time work in your institute. /s/ T. V. Galambos

A portion of my reply, dated June 29, 1956,

> Your plans for further study interest me. It is quite likely that an opening will exist in our structural steel group for a man (we wouldn't say "man" now; we'd say "person") who will work on problems in plastic analysis or in column studies. /s/ Lynn S. Beedle

From Ted Galambos, July 8:

> I received your letter of June 29, together with the pamphlets and the applications forms. I thank you very much for the interest you've shown. Enclosed I send you the filled out forms and the pictures. I've also written to registrar at North Dakota University. In case you desire to interview me before you make a decision, I will drive down to Bethlehem on any Friday night and be there all Saturday. The pamphlets have shown me that I would like the type of work done at your laboratories and that I would enjoy my studies at Lehigh University. /s/ T. V. Galambos

Reply, July 17:

> I am glad you are interested in research work at the laboratory and am awaiting the recommendation forms and so on. From the information you have supplied, it appears that you have a good background of experience and academic work that would stand you in good stead for research. Suppose I get in touch with you when your file is complete. July 28 is a possible date.

Telegram of July 27 to Ted Galambos:

> Dossier complete. Am able to offer you research assistantship. Special trip to Lehigh will not be necessary. Please call me collect at Hellertown, Terrace 88350.

The next day Ted called. The file shows that on July 29, I sent a note to our CE Graduate Officer, Prof. Cyril D. Jensen, to say that I had offered Ted a half-time research assistantship at the second level and that he would write a letter of acceptance. This was followed with my own letter to Ted:

> It was a pleasure to talk to you Saturday by phone. This letter is to confirm my offer to you of a research assistantship half-time in the structural metals division. The stipend would be $175 per month.

Letter from Ted Galambos dated August 3:

> I received your letter of July 31 with the offer of the research assistantship. Since the conditions of payment (that's the first and last time I ever heard Ted say anything about "payment") are satisfactory to me, I am accepting that offer, and I will report to you on September 1, 1956, as we had agreed in our conversation.

This was followed by an exchange to settle on the actual starting date. The final excerpt from those old files is from his first Fritz Lab quarterly report. Since the quarter ended September 30, and he started September 3, it is really a report on one month's work.

> My activities as a half-time research assistant during September, 1956, were as follows:
> 1) getting familiar with the personnel, the facilities, and the equipment of the laboratories;
> 2) reading of reports on Welded Continuous Frames and their Components project, especially on the buckling and residual stress problems;
> 3) assisting Lambert Tall on approximately 80 coupon tests: 65 coupons on the 120,000 Tinius Olson machine and 15 coupons on the 300,000 Baldwin Tate-Emery testing machine.

The above exchange of correspondence shows how quickly things moved in those days, a promptness which turned out to be fortuitous in view of the subsequent contributions Ted made to the Fritz Laboratory -- and to the profession.

We must thank the AISC for its support of research that made it possible for us to make the offer in the first place. Further, Ted Galambos, along with a host of graduate students, is indebted to Bruce Johnston for his vision in realizing the opportunities in plastic design. This is the topic that really attracted Ted to Lehigh University.

These are the highlights of Ted's nine-year period at Lehigh:

1956 - Research Assistant

1958 - Research Associate

1959 - Ph.D. degree and appointment as Assistant Professor of Civil Engineering. (The second year in rank he received a "whopping" 13% increase in salary, which took him from a base of $5300 to $6000.)

1962 - Appointed Associate Professor

1963 - Passed his exam as a registered engineer.

1965 - Lecturer in 1965 Plastic Design Conference. Departed for Washington University, St. Louis.

Let's take a look at some of the details. As a new man, Ted became aware of a number of things: Housing was in short supply. He didn't always get his desk where he wanted it. The initiation into the Fritz Engineering Research Society showed him that there was more to joining the Fritz Lab than perhaps he might have guessed. We introduced him to Gus' corner store -- now unfortunately gone. He was introduced to the Fritz Lab picnic, with games for the kids organized by Dorothy Fielding and a softball game between students and faculty. He had to endure my poems on the occasion of a departing colleague. Along with the rest of us, he would bring his kids to the Christmas party, held in the shadow of the 5MM testing machine. (Santa Claus came by way of the crane from the sixth floor balcony during the carol singing.) He attended the numerous weddings of the time.

In what might have been part of Ted's early inspiration, one month after he arrived, Ph.D. degrees were given to Bob Ketter, Gerry Haaijer, and Alf Huber, three among Lehigh's "greats".

Then Ted got his own degree, in June of 1959.

His research? He must have participated in or directed at least 10 projects, many in the area of structural stability.

In fact, his column studies led, eventually, to his election as chairman of the CRC, the Column Research Council, (which is now known as the Structural Stability Research Council).

In 1965, the lure of the West attracted him and he joined the faculty of Washington University at St. Louis.

* * *

This age of awareness: What is it? The dictionary gives us these definitions:

Age: an historical or other period

Aware: conscious

I belabor the point, because of course, we are <u>always</u> aware. As we age, we simply become aware of different things.

Take Ted's awareness: At age 20, the need to study; age 25, the need for experience; age 27, conscious of the potentials of plastic design and further study at Lehigh; age 36, greener pastures in St. Louis and the opportunities of a full professorship; at age 41, the opportunity for leadership as a department chairman; age 49, (just last year) aware that perhaps being a department chairman wasn't all it was cracked up to be; at age 50, aware of the stir he's created by getting all of us to come to St. Louis for his birthday party.

Thus, we are always aware, and the question is, aware of what?

Many of us were part of a group that was caught up in the 1970's in the Earth Day activity, caught up with the realization of the limited resources that we have on this planet earth. It was brought to my mind, again, in the early 1970's when we visited Cairo in connection with a tall building conference. Through the spaces between the high-rise hotels along the Nile we saw the 5000-year-old pyramids. And the question was unavoidable: what will our age leave as evidence of our civilization 5,000 years from now? One of today's buildings? Probably not, because we've stopped building pyramids. Could it be the recycled city? I think, myself, that this is likely.

Perhaps what we leave for the year 7000 lies in the character of our own age or "dynasty". And what is that age? It's been called the "space age", the "information age", the "oil age", "the materials age". A Wall Street Journal headline proclaimed it the "age of anxiety".

I call it the "Age of Awareness", the awareness of the effects of what we do, the effects of the past century of exploitation of the earth.

So, what we leave may not be physical. A particular constructed facility may not survive, but something more important may: A better civilization. We need to think about our stewardship of earth, its people, the gifts we've received, because without that stewardship, then for sure all that will be left will be the pyramids -- and maybe not even them.

We can see our opportunity and challenge in this somewhat edited description of the evolution of the engineering function, first provided by Karakash. First in the cycle, we had the age of crafts. One moved directly from the perceived need to the constructed facility. Our craftmanship took care of the urgent need for shelter and protection. Next came the industrial revolution, which introduced "design" and "mass production" into the process of achieving a construction facility. It also introduced "operation". Material benefits were extended from the few to the many. Then came the scientific revolution, or the scientific age, which added "research" and "development" in the chain. It gave us an opportunity for an even better life and further opportunity to fulfill human purpose.

Our present age, which I choose to call the "Age of Awareness" is one in which we realize that the constructed facility and its operation has an impact on society. If we are going to understand that impact, it will require a study of man. And the study of man then leads us back to close the loop -- to examine the need and its quality. And that's what is important. The quality of the need.

The men in space saw it. They could look from their capsule and see the beautiful orb of the earth, but see it as an island. They could see that it is limited. It won't conveniently expand to accommodate us. The part that supports life -- the biosphere -- is so incredibly small: 370 feet off the ground (the height of the tallest tree), 500 feet down into the ocean; 20 feet down in the ground (the roots of trees). It's an incredibly thin layer that supports life.

The Post Office Department issued stamps in 1970 to remind us of these limitations. The four-stamp series proclaimed, "Save our Soil, Save our Cities, Save our Water, Save our Air." Unwittingly, we've carried out a massive assault on the air, the water, and the land, especially during this century. Today, we know we can't abuse it, and in retrospect we have made great strides in a few areas, of which reduced air pollution is one. Many will remember the pictures of New York on Thanksgiving Day, 1966, when air pollution completely paralyzed that city. Perhaps solutions have been possible in this area because we are all affected. Our health is affected. Technology was able to bring about a solution. (And besides, who is going to lobby against doing something about cleaning up the air?) Other problem areas, unfortunately, remain unsolved problems. At the April 1979 ASCE meeting, Senator Muskie said, "We have never really disposed of hazardous materials; we've only stored it." He pointed out that it would cost between $20-30 billion just to remedy the old problems of storing hazardous waste.

So finally, in a reversal, it comes down to fighting to save the earth from man. Now the elements and the animals must be protected from man, not the other way around.

We need to think again of this precious heritage, our country. Much has been done to right the wrongs of the past century, but we need to do more. That's another way of saying, what are we going to do with this awareness once we finally get it? How is this realization of past exploitation going to affect us?

As educators,

> Our challenge is to prepare young people to become the provident custodians of the earth and its people, not its abusive exploiters. The why has to come from the love of humanity and the commitment to its continuity. The how from the application of science and technology. (Karakash)

What are we going to do with this awareness as researchers? I cite the model given to us by two past directors of Fritz Lab, Inge Lyse and Bruce Johnston: Select a project that has significant potential benefit and stay with it until the results are used. At Fritz Lab Ted Galambos personified this approach.

As designers, I would say the challenge is in two parts. We've already discussed the former: Does our design fully meet a need worthy of our heritage? Will it add to the quality of life? Perhaps the second part was best put by the then-Mayor of Dallas in 1972 at a meeting of the National Academy of Engineering (to which we are all most pleased that Ted Galambos has been elected) when he said, "An Engineer is needed not only for his technology. Maybe even more he is needed to act out his citizenship."

The 80's will be a decade of <u>reaping</u>. If we were aware of the right things in the 70's and responded in the right way, then the 80's won't be bad.

We've seen that awareness is a growing thing and that the experiences of life and how we respond to those experiences has much to do with this growth. Ted Galambos' first 50 years have demonstrated this, and

the point is illustrated in a portion of Norman Vincent Peale's recent Easter message in Guideposts magazine. He is describing a man who was involved in a serious accident.

> I could hear a voice, kind of from the distance saying, 'There isn't much chance for this fellow; I hope we can save him.' It was touch and go for days, but by the grace of God, I got well. And now it is all so different, so unbelievably wonderful; it's as if I never really lived before.

As Dr. Peale said, "what happened to this man was that he had experienced a new awareness of life, a deeper sensitivity. A keen delight had been put upon this thing called life, which so often we take for granted and treat as if it were something ordinary."

This "delight in life" is so much a part of him, that I think Ted Galambos must have been born with it.

Happy Birthday, Ted.